

A new species of *Sigambra* (Polychaeta, Pilargidae) from the abyssal plains of the NE Atlantic

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GORDON L J PATERSON AND ADRIAN G. GLOVER

Polychaete Research Group, Department of Zoology, The Natural History Museum, London SW7 5BD, UK.

INTRODUCTION

During an intensive study of the benthic communities of the NE Atlantic abyssal plains (Rice *et al.* 1994), a new species of *Sigambra* was identified. It was conspicuous in being one of the more abundant species and certainly the dominant predator. The species was widespread, being recorded from study sites from the Cap Verde Abyssal Plain in the south to the Porcupine Abyssal Plain in the north.

MATERIAL AND METHODS

All specimens were collected using a modified United States Naval Electronics Laboratory spade box corer (SBC). Samples from the Porcupine, Madeira and Cape Verde Abyssal Plains were sectioned horizontally into 0–1 cm, 1–3 cm and 3–5 cm layers and processed through a number of sieves – 1, 0.5 and 0.3 mm. Samples from the Tagus Abyssal Plain were taken with a vegematically modified box corer and only the inner nine subcores were processed through a 0.3 mm sieve.

MATERIAL STUDIED

Specimens have been deposited in a number of taxonomic institutions and corresponding registration numbers are given below. Abbreviations: AM – The Australian Museum, Sydney; LA – Los Angeles County Museum of Natural History; MNHN – Museum National d'Histoire Naturelle, Paris; BMNH – The Natural History Museum, London; NMNH – National Museum of Natural History, Smithsonian Institution; NMS – The National Museums of Scotland; NMW – The National Museum of Wales; ZH Zoologisches Institut und. Museum, Hamburg; ZMUC – Zoological Museum, Copenhagen.

Holotype: Porcupine Abyssal Plain *Challenger II* Cruise 111: 53201#29 48°51.5' N 16°29.6' W, 4844 m, sediment layer 1–3 cm 0.5mm sieve, 14/4/1994 (BMNH 2000.1852).

Paratypes: Porcupine Abyssal Plain the following samples centred on 48°50' N 16°30' W in 4850 m:

Discovery Cruise 185: 11908#18: 1–3cm 0.3 mm sieve 1 ind. 28/8/1989.

Challenger II Cruise 79: 52701#5: 1–3 cm, 0.3mm sieve 4 ind.; 1–3cm 0.5mm sieve 2 ind (NMSz: 2000.214).16/5/1991.

52701#9: 1–3 cm 0.5mm 1 ind (ZMH). 17/5/1991.

52701#25: 1–3 cm 0.3mm sieve 1 ind.(MNHN-POLY 53); 0–1 cm 0.5 mm sieve 1 ind (NMW.Z: 2000.070).; 3–5 cm 0.5mm sieve 2 ind (NMNH 186794). 20/5/1991;

52701#29: 1–3 cm 0.3 mm sieve 1 ind. (AM); 1 ind. (ZMUC-POL-1013 21/5/1991.

52701#47 1–3 cm 0.3 mm sieve 1 ind. (LA) 21/5/1991.

Challenger Cruise 111: 53201#23 1–3 cm 0.3 mm 1 ind. 13/4/1994;

53201#26 1–3 cm 0.3 mm sieve 1 ind., 1–3 cm 0.5 mm sieve 2 ind., 3–5 cm 0.3 mm 1 ind. 14/4/1994;

53201 # 29 1–3 cm 0.25 mm sieve 1 ind., 1–3 cm 0.5 mm sieve 1 ind., 3–5 cm 1 mm sieve ind. 14/4/1994;

53205#2 0.3 mm 0–1 cm sieve 1 ind., 3–5 cm 0.5 mm sieve 1 ind., 18/4/94.

Tagus Abyssal Plain centred on 38°N 11°W 5035 m: *Discovery* Cruise 186: SBC365 3 ind. 26/9/1989; SBC366 1 ind. 26/9/1989; SBC367 5 ind. 26/9/1989; SBC368 5 ind., SBC369 2 ind. 27/9/1989; SBC371 2 ind. 28/9/1989.

Madeira Abyssal Plain centred on 31°10' N 21°10' W 4985m: *Discovery* Cruise 194: 12174#35: 1–3 cm 0.3 mm sieve 2 ind.: 1–3 cm 0.5 mm sieve 1 ind.; 3–5 cm 0.5 mm sieve 3 ind. 21/8/1990.

12174#43: 1–3 cm 0.3 mm 1 ind. 22/8/1990.

12174#53: 1–3 cm 0.3 mm sieve 2 ind. 23/8/1990

12174 #60: 1–3 cm 0.3 mm sieve 1 ind. 24/8/1990.

12174#80 0–1 cm 0.3 mm sieve 1 ind.; 5–10 cm 0.5 mm sieve 1 ind. 28/8/90.

Cape Verde Abyssal Plain centred on 20°N 30°W 4500–4600 m: *Discovery* Cruise 204: 12600#320–1 cm 0.3 mm sieve 1 ind. 6/10/1994.

In addition the following material was examined: *Sigambra bidentata* Britaev & Saphronova, 1981 Natural History Museum Polychaete Collection Z1986:178–183 (5 paratypes), Vityaz Stn 7488 38° 41' N:133° 45' E 1550 m Sea of Japan. *Sigambra gracilis* Britaev & Saphronova, 1981 ZR1986.184–185 (2 paratypes), Vostok Bay, Sea of Japan. *Sigambra phuketensis* Licher and Westheide, 1997 Z1993. 15–16 (2 Paratypes), Bang Tao, W. Phuket Island, Thailand.

TAXONOMIC ACCOUNT

Family **PILARGIDAE**

Genus **SIGAMBRA** O.F.Müller, 1858

Species ***S. magnuncus*** sp. nov.

(Figs 1–5)

DESCRIPTION

Holotype: Length 3.7 mm for 33 chaetigers, greatest width of body 0.3 mm.

Paratypes: Range from length 0.5 mm for 13 chaetigers to 10.5 mm for 50 chaetigers, number of segments depends on size of individual. (Fig. 5).

Body unpigmented; slightly flattened anteriorly, but becoming more rounded posteriorly; anterior chaetigers widest.

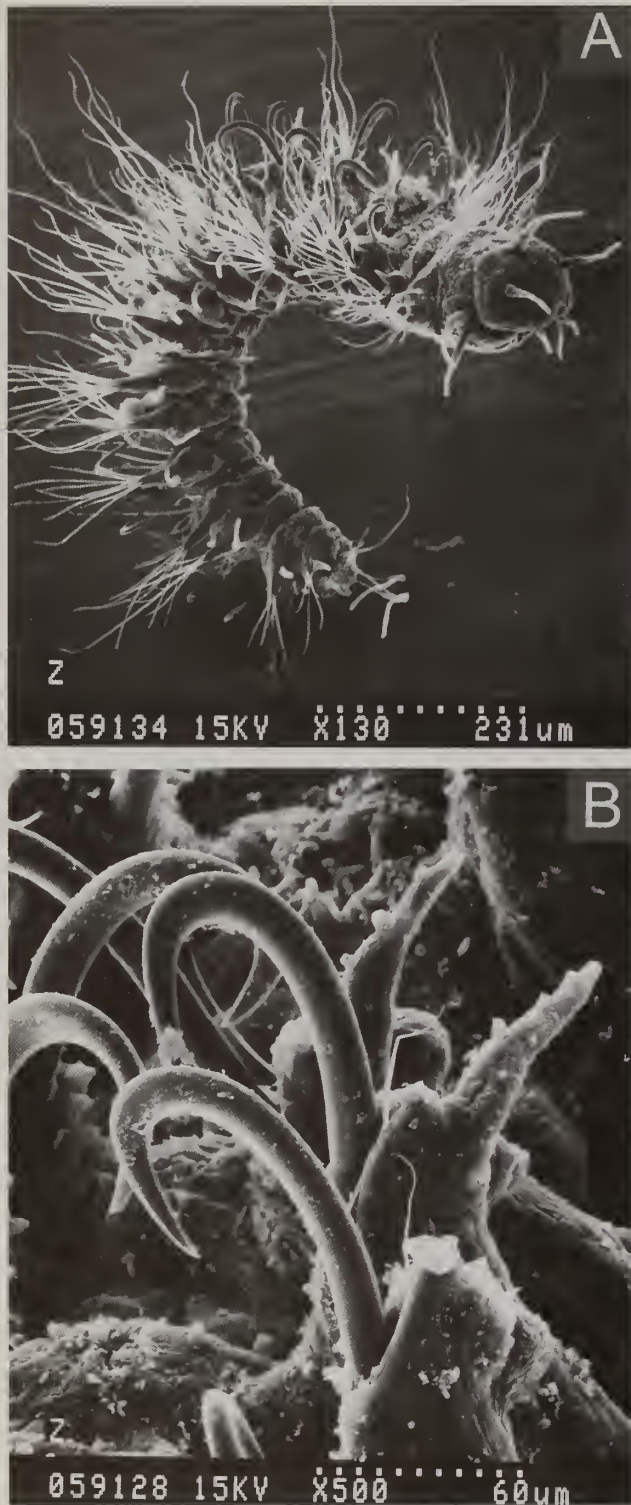


Fig. 1 SEMs of *Sigambra magnuncus* (MAP Discovery Investigations 12174#60 0.5 mm sieve, 1–3 cm) A. General view of individual. B. View of notopodia, note the small capillary chaeta in each notopodium

Prostomium rounded, slightly indented laterally at insertion of palps and prostomium. Palps biarticulate with relatively long palpostyles; palpophores fused distally over half their length. Three antennae, median antenna longest, situated slightly posterior to



Fig. 2 SEMs of *Sigambra magnuncus* (MAP Discovery Investigations 12174#80 0.5mm sieve, 1–3 cm) Dorsal view of anterior region.

laterals in smaller specimens, but more level with them in larger individuals. A pair of cushion like nuchal organs, situated on either side of the median antennae. Eyes absent. Pharynx without jaws, armed with eight equal size, slightly pointed papillae.

Peristomium approximately twice as long as first chaetiger. Two pairs of long tapering tentacular cirri, dorsal cirri longer than ventral, and slightly shorter than median antennae. A row of low cushion-like papillae (sense organs) extending across dorsal surface of peristomium (may only be visible under high magnification).

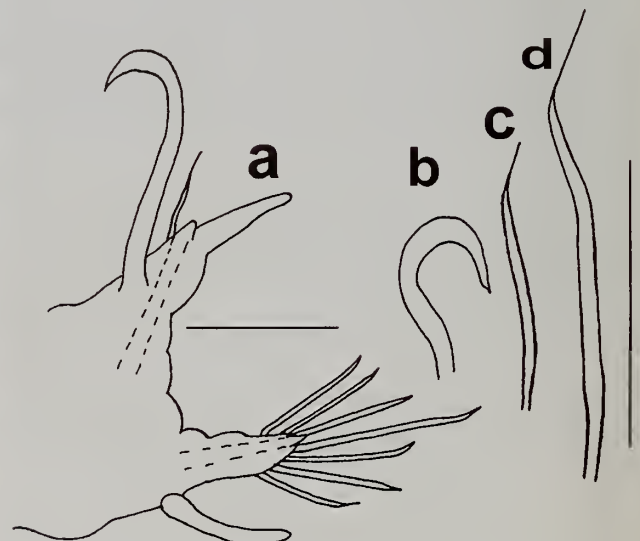


Fig. 3 a Parapodium from mid region, anterior view. b notopodial hook, c & d neurocapillaries. Scale bars = 0.1 mm.

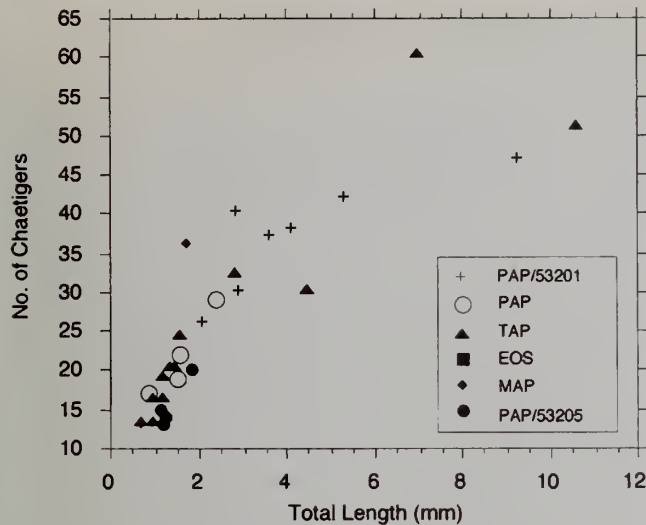


Fig. 4 Graph showing the relationship between size and number of chaetigers. Individuals from different sample sites are identified. PAP—Porcupine Abyssal Plain, MAP—Madeira Abyssal Plain, TAP—Tagus Abyssal Plain, EOS—Cap Verde Abyssal Plain.

Parapodia biramous; anterior parapodia laterally orientated, becoming more dorsal in median and posterior chaetigers. A row of cushion-like papillae extending across dorsal surface between notopodia on each chaetiger.

Notopodia pointed, with straight, blunt-tipped internal aciculae. Dorsal cirri of chaetiger 1 long, thin and tapering; nearly equal in length to median antenna; subsequent dorsal cirri initially shorter with wider bases, but in posterior chaetigers becoming more slender longer and projecting dorsally. Large hooks emergent on chaetiger 3 (Fig. 1b, 2, 3b) until one or two chaetigers from pygidium; in posterior chaetigers hooks meeting in midline. Short, delicate capillaries projecting from most notopodia, just one in anterior chaetigers (Fig. 1b, 3a), usually becoming two in posterior segments.

Neuropodial lobes pointed, with blunt-tipped, straight aciculae (Fig. 3a); initially orientated laterally but become more vertical and dorsal in posterior chaetigers. Ventral cirri absent on chaetiger 2; on

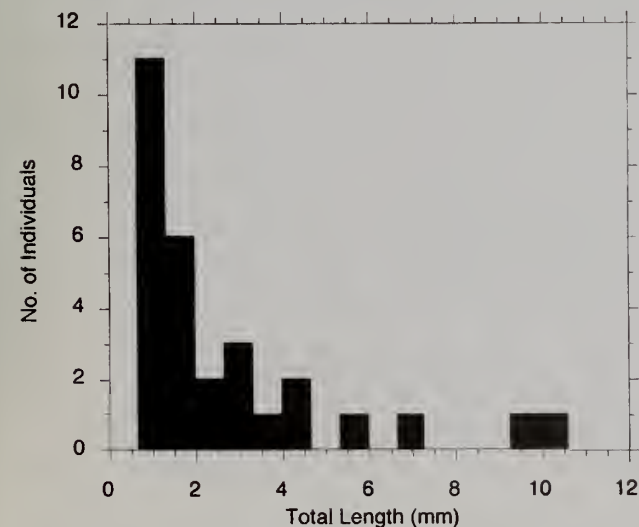


Fig. 5 Histogram showing the range of sizes of *S. magnuncus* collected in the NE Atlantic.

other chaetigers thin and tapering, equal to or shorter than neuropodia, equal to or slightly longer than dorsal cirri. Neurochaetae simple capillaries, slightly expanded at the base just free of the podia, tips quickly taper into a prolonged point (Fig. 3 c,d).

Pygidium with two tapering cirri. Anus dorsal.

DISTRIBUTION. *S. magnuncus* has been recorded from the abyssal plains of the NE Atlantic at depths from 4000 m to 5085 m.

ETYMOLOGY. The name of this species derives from the large conspicuous hooks on the notopodia (Latin *magnus* – large *uncus* – hook).

DISCUSSION

Taxonomic Affinities

Licher & Westheide (1994) suggested that the Pilargidae was not a separate family and that species in the family belonged in the Hesionidae. This hypothesis has been rejected by Pleijel (1998) and Pleijel and Dahlgren (1998) on the basis that Licher & Westheide's (1994) original study was not rooted in an appropriate outgroup. Subsequent analysis by Pleijel and Dahlgren (1998) indicated that the Pilargidae and Hesionidae were different and non-overlapping groups. We, therefore, retain the family Pilargidae.

Including *S. magnuncus*, there are 17 described species of *Siganbra* (Licher and Westheide, 1997). Based on examination of *Siganbra* material in the NHM and the revision of Licher & Westheide (1997), *S. magnuncus* shares certain features with *S. ocellata* (Hartmann-Schröder, 1959), *S. bidentata* Britaev & Saphronova, 1981 and *S. qingdaoensis* Licher & Westheide, 1997, namely the ventral cirrus is missing on chaetiger 2 and there are eight papillae in the pharynx (Licher & Westheide, 1997). The relative proportions of the dorsal and ventral cirri suggest similarities with *S. ocellata*, however, in *S. magnuncus* the notopodial hooks start on chaetiger 3 rather than chaetiger 6 as in *S. ocellata*. In *S. bidentata* and *S. qingdaoensis* the notopodial hooks can start from chaetigers 3, similar to *S. magnuncus*, but in addition to differences in cirral length, *S. magnuncus* differs from *S. bidentata* in not having bidentate neurochaetae. *S. magnuncus* differs from *S. qingdaoensis* in having one capillary notochaeta in anterior chaetigers, becoming two in posterior chaetigers, whereas in *S. qingdaoensis* there are always two notopodial capillaries. Finally, the notopodial hooks in *S. magnuncus* are much larger than in comparable sized individuals of the other species.

Growth and abundance

S. magnuncus was most common in samples from the Porcupine and Tagus abyssal plains with densities of 4 to 32 individuals per m², while lower numbers were found in the Madeira and Cap Verde samples. This was partly due to lower overall densities of polychaetes at these latter sites (Paterson *et al.* 1998), but their distribution suggests that this species is more common in northern abyssal areas. Also analysis of the distribution within the sediment suggests that this species is found within the sediment rather than on the surface.

There is a good range of sizes within the collection, allowing allometric changes to be noted. Notopodial hooks in smaller specimens appear to be extremely large, but in larger specimens these hooks are proportionately smaller. This suggests that hooks are produced at a set size, not affected by growth. The hooks always occur first on chaetiger 3.

Size of specimens ranges from 0.5 to 10.5 mm, although most

individuals were between 0.75 to 4.5 mm long (Fig. 5). The relationship between length of specimen and number of chaetigers is given in Fig. 4. The graph indicates that initially as individuals increase in length so the numbers of chaetigers increases linearly, however, at the upper size there is wide variation in numbers of chaetigers, suggesting that there may be an upper limit to chaetiger number.

Growth in *Sigambra grubii* Muller, 1858 also appears to show a linear relationship between length and number of chaetigers over a similar size range as *S. magnuncus* (Salazar-Vallejo, 1990). However, there was more variation in the relationship between size and the chaetiger on which the first hook appeared.

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